

## ASPARAGUS: A NEW HOST RECORD FOR *HELICOVERPA ARMIGERA* (HÜBNER) (LEPIDOPTERA: NOCTUIDAE)

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### Abstract

*Asparagus officinalis* (Liliaceae) is recorded as a potential host of *Helicoverpa armigera* (Hübner) and an earlier record of this plant as a host of *H. punctigera* (Wallengren) is questioned.

### Introduction

*Helicoverpa* spp. are generally acknowledged as major pests of a wide range of crops in Australia. Zalucki *et al.* (1986) collated the published host records for both *H. armigera* (Hübner) and *H. punctigera* (Wallengren) and reported 75 and 127 species of plants as hosts of the two species respectively. Zalucki *et al.* (1994) added a further 26 species to the list for *H. armigera*.

Here, we add asparagus (*Asparagus officinalis* [Liliaceae]) to the host list for *H. armigera* and question the validity of the record in Zalucki *et al.* (1986) of *A. officinalis* as a host of *H. punctigera*.

### Methods and Results

Trials on the agronomy of asparagus were carried out from 1988 to 1997 at Bundaberg Research Station (24°52'S, 152°21'E) to support a small commercial industry in southeast Queensland (J. K. Olsen, pers. comm.). Spears were harvested from August to October. In October 1996 *Helicoverpa* eggs were noticed among the bracts of freshly harvested spears. Eggs may have been laid on the asparagus in previous years but elicited no interest in those harvesting the crop. Eggs were present on 5-10% of spears and frequently several eggs were present on a single spear.

Spears with eggs were held until the eggs hatched. The developing larvae were given fresh spears on which to feed every 3-4 days until pupation. All rearing was done in a constant temperature cabinet at 25°C with a 12:12 light:dark cycle. Most of the resultant moths were dissected for identification and several were identified on wing characters (Common 1953).

All the moths were *H. armigera*. The developmental rates of the larvae reared on asparagus and of the subsequent pupae were the same as those of larvae and pupae collected as eggs on tomatoes at the same time and reared on a standard navy-bean based diet (Twine 1971), commonly used to rear *Helicoverpa* species, although detailed records of the developmental times were not kept. There was little mortality. The moths were of similar size and appearance to those reared on diet and they showed no obvious defects. The reproductive capability of the moths was not tested as most were dissected for identification.

## Discussion

*Asparagus officinalis* can be added to the list of food plants for *H. armigera* and probably to its host list. Eggs were laid on the plant and larvae developed normally to produce apparently healthy adults. Kitching and Zalucki (1983) warn of the dangers of assuming that the presence of eggs on a plant is evidence that it is a food plant for the insect and suggest that a food plant should be one on which "the species can complete its immature feeding period and then successfully complete its pupal/adult metamorphosis." *Asparagus* satisfies this condition for *H. armigera*. Zalucki *et al.* (1986) state that for a plant to be considered a host, the insect must be able to complete development to the adult stage and be capable of producing fertile offspring. While the reproductive capability of *H. armigera* reared on asparagus was not determined, there was no indication, through factors such as reduced developmental rate, reduced size or the presence of deformities, that the moths would not have produced fertile offspring. At the very least, asparagus is a potential host of *H. armigera*.

It is unlikely that *H. armigera* would become an important pest of commercially grown asparagus. Spears emerge from the ground and are harvested in one or two days so eggs would not hatch before harvest. It is likely that many eggs would be dislodged from the spears during postharvest washing, while the development of any remaining eggs would be slowed, or the eggs killed, by subsequent hydrocooling of the spears, ideally to 2-3°C. However, it is possible that larvae could develop and be present on marketed produce. Unharvested spears develop into ferns in several weeks but it is not known if ferns will support larval development. Larvae may move to freshly emerged spears as fern growth proceeds and so complete development on a succession of spears.

Zalucki *et al.* (1986) included asparagus as a host of *H. punctigera*, based on the records in Lea (1928). However, these records should be treated with caution. Lea (1928) nominally wrote about *Heliothis obsoleta* (a junior synonym of *H. armigera*) but, as discussed by Common (1953), probably was referring to *H. punctigera*. Lea (1928) acknowledged that much of the information in his article was drawn from literature from the United States of America and, as stated by Common (1953), "it is difficult to decide therefore how much of his information applied to the local species." The host table in Lea (1928), which includes asparagus, does not specify if the records were local or from the literature and asparagus is not mentioned in discussions of observed damage to plants in the text. There is no evidence that Zalucki *et al.* (1986) verified Lea's host records before including them in their review. Hence there must be considerable doubt about the veracity of the record of asparagus as a host for *H. punctigera*.

Both *H. armigera* and *H. punctigera* were present in the Bundaberg district when the eggs were noticed on asparagus. Eggs collected then from nearby

tomatoes and reared to adults on diet produced 56% *H. armigera* and 44% *H. punctigera* (Kay, unpublished data). That only *H. armigera* was reared from eggs found on asparagus indicates that asparagus was not attractive or suitable for oviposition by *H. punctigera*.

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